

Claims

What is claimed is:

1. A display apparatus, comprising:
 - a light modulating layer having a first surface;
 - a light cavity for providing light to the light modulating layer;
 - a light guide disposed to receive the light from the light cavity and output the light at a low angle relative to the first surface of the light modulating layer;
 - a turning lens disposed to receive the low angle light output from the light guide and redirect the light toward the light modulating layer;
 - a diffusely reflecting polarizer disposed between the turning lens and the light modulating layer for receiving the redirected light and transmitting a component of the redirected light having a first polarization toward the light modulating layer and diffusely reflecting a component of the redirected light having a second polarization different than the first polarization.
2. The display apparatus of claim 1, wherein the low angle is less than 20 degrees.
3. The display apparatus of claim 1, wherein the turning lens includes a relatively planar surface facing the diffusely reflecting polarizer and a structured surface facing the light guide.
4. The display apparatus of claim 1, further including a diffusion layer disposed between the diffusely reflecting polarizer and the light modulating layer for diffusing light transmitted by the diffusely reflecting polarizer.
5. A lighting system, comprising:
 - a light source for generating light; and
 - a reflector including a diffusely reflecting polarizer disposed closer to the light source and

reflective louvers disposed to receive the light and specularly reflect s-polarized light and diffusely reflect p-polarized light.

11. The lighting system of claim 10, wherein each louver includes a diffusely reflecting polarizer disposed closer to the light to diffusely reflect the p-polarized light and specularly transmit the s-polarized light and a specular reflector disposed further from the light to the specularly reflect the s-polarized light transmitted through the diffusely reflective polarizer, wherein the specularly reflected light is retransmitted through the diffusely reflective polarizer to provide specularly reflected s-polarized light.

12. The lighting system of claim 10, wherein the louvers are pivotally mounted to a frame.

13. A display apparatus, comprising:
a light modulating layer;
a light cavity adapted to provide light to the light modulating layer, the light cavity reflecting incident light with a first degree of depolarization of the incident light; and
a diffusely reflecting polarizer, disposed between the light modulating layer and the light cavity, for transmitting a component of the light provided by the light cavity having a first polarization for viewing and diffusely reflecting a component of the light, received from the light cavity, having a second polarization, the polarizer diffusely reflecting the light of the second polarization with a second degree of depolarization greater than the first degree of depolarization to provide light of the first polarization;

wherein at least a portion of the diffusely reflected light of the first polarization is reflected by the light cavity without depolarization toward the diffusely reflecting polarizer for transmission therethrough.

14. A display apparatus, comprising:

the light cavity may or allow the incident light to have a degree of depolarization but that structure is not intended.

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incident light has the first degree of depolarization and not the light cavity (reflecting layer/surface) of cavity.

a specular reflector disposed further from the light source;

wherein a component of the light having a first polarization is transmitted by the diffusely reflecting polarizer, specularly reflected by the specular reflector, and retransmitted through the diffusely reflecting polarizer to provide specularly reflected light of the first polarization having a first distribution;

wherein a component of the light having a second, different polarization is diffusely reflected by the diffusely reflecting polarizer to provide diffusely reflected light having a second distribution different than the first distribution.

6. The lighting system of claim 5, wherein the reflector curves about the light source such that the specularly reflected light of the first polarization has a substantially uniform distribution.

7. The lighting system of claim 5, further including reflective louvers disposed to receive and reflect the components of the light having the first and second polarizations.

8. The lighting system of claim 7, wherein each louver includes a diffusely reflecting polarizer disposed to diffusely reflect the light having the second polarization and specularly transmit the light having the first polarization and a specular reflector attached to the diffusely reflecting polarizer and disposed to receive and specularly reflect the light having the first polarization transmitted by the diffusely reflecting polarizer.

9. The lighting system of claim 8, wherein the diffusely reflected light of the second polarization is p-polarized light and the specularly reflected light of the first polarization is s-polarized light.

10. A lighting system, comprising:
a light source for generating light; and

a light cavity for providing light; and
a diffusely reflecting polarizer disposed to receive the light, the diffusely reflecting polarizer having a concentration of a disperse phase selected to provide a desired gain distribution.

15. The display apparatus of claim 14, wherein the dispersed phase concentration is 30% or more by weight.

16. The display apparatus of claim 14, wherein the dispersed phase concentration is 35% or more by weight.

17. The display apparatus of claim 14, wherein the dispersed phase concentration is 40% or more by weight.

18. A display apparatus, including:
an emissive element for providing light; and
a contrast enhancing filter disposed on a viewing side of the element, the filter including an absorbing polarizer and a reflecting polarizer disposed closer to the element than the absorbing polarizer.

19. The display apparatus of claim 18, wherein the reflecting polarizer is a diffusely reflecting polarizer.

20. The display apparatus of claim 18, wherein the element has a lateral dimension, wherein the diffusely reflecting polarizer is spaced from the element by no more than 3 times the lateral dimension.